

NASA News

National Aeronautics and
Space Administration

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For Release:

IMMEDIATE



RELEASE NO: 80-5

HOUSTON MISSION CONTROL GEARING UP FOR SHUTTLE FLIGHTS

Although it somewhat resembles a futuristic movie prop from the latest space epic, Mission Control Center at NASA's Johnson Space Center in Houston is a place where serious technicians are engaged in a great adventure -- the quest for knowledge.

Today, Mission Control is preparing for the initial Earth-orbital flight later this year of America's first manned Space Shuttle. The reusable Shuttle will be rocketed into orbit and glide back to Earth after its mission is completed.

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January 17, 1980

N80-71636

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(NASA-News-Release-80-5) HOUSTON MISSION
GEARING UP FOR SHUTTLE FLIGHTS (National
Aeronautics and Space Administration) 4 p

The Space Shuttle, as workhorse of the space program, will carry communications satellites, weather satellites and scientific experiments into space on a regular basis, return to Earth and a few weeks later reenter orbit with another payload.

NASA has worked out a pay-as-you-go plan to allow individuals, companies, universities, foreign governments and others to rent space in the large cargo area for scientific experiments. Such space aboard the Shuttle is sold out for the first 42 flights.

Before the actual launch, simulated missions are conducted to check out each detail of the equipment. Establishing an effective interplay between people and machinery is the most difficult of all problems in developing a spacecraft operational system that works. There are approximately 75 controllers working each of the eight-hour shifts in the Mission Control Center to make certain the flight operations work perfectly in all aspects and at all times.

The controllers work in teams -- each with a different function. The flight control team is composed of technical representatives from the many technical disciplines.

These staffers monitor the whole variety of spacecraft subsystems, including life support, thermal control, propulsion, navigation, flight operations, communications, and vehicle systems. There are specialists who work on trajectory patterns, those who work with experiments and those who direct NASA's worldwide tracking network.

Each controller constantly monitors the telemetry from the spacecraft, evaluating the performance of the system which is his or her responsibility, verifying that it is working properly and observing the crew's use of the system to make certain it is responding correctly.

The simulated tests are as close to the real action as one can get. Pete Frank, Chief of the Flight Control Division at Johnson, said: "...it can get so realistic that there are times when you actually forget you are simulating. You become so involved and so wrapped up in the simulation that sometimes it feels like it's the real mission."

There are three phases to the simulations: launch, orbit and reentry. During the countdown, the Houston Mission Control Center simply monitors. The launch control center at Kennedy Space Center in Florida is responsible for the countdown and getting the spacecraft to a liftoff condition. Once launched, Houston Mission Control takes over.

"The level of activity here is quite high," said Frank. "A lot of things are happening; a lot of different events occur; and we are monitoring those to verify that the vehicle is working correctly."

During the reentry phase, it is Mission Control's main goal to see that the spacecraft guides itself through the difficult reentry phase and that the vehicle is performing as expected. If it is not performing well, Frank said, it is Mission Control's responsibility to come up with the best technique for solving the problem.

Frank said Mission Control is not yet ready for the flight, but "we will be ready when we are needed. We will be there when the vehicle is."

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